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REPORT

Order No.: 5933/3-I **Page 1 of 8 pages**
(Revised version of test report no. 5933/3 of 5 October 2016)

Client: PLAST FARB Sp.z o.o.sp.k
Skłodowskiej Curie 87A
87-100 Torún / Poland

Date of order: 20 September 2016

Receipt of sample material: 21 September 2016

Origin of sample material: From the client

Purpose: Analysis of security envelopes for security mechanism

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The present report refers exclusively to the samples as laid out therein. Information and statistical data on the results can be obtained on request.

DAkkS
Deutsche
Akkreditierungsstelle
D-PL-14160-01-01
D-PL-14160-01-02

Sample Material

For analysis the following sample material was in hand:

Sample designation	Sample description
PLASTSAFE Security Envelope	Envelope material: LDPE-film Film thickness: 70 µm Side seam: heat-sealed seams Outside dimensions: approx. 195x295 mm Closure system: security tape (green/yellow, width: 35 mm)

Envelope no. PB50002099: original sample

Carrying out of the Tests

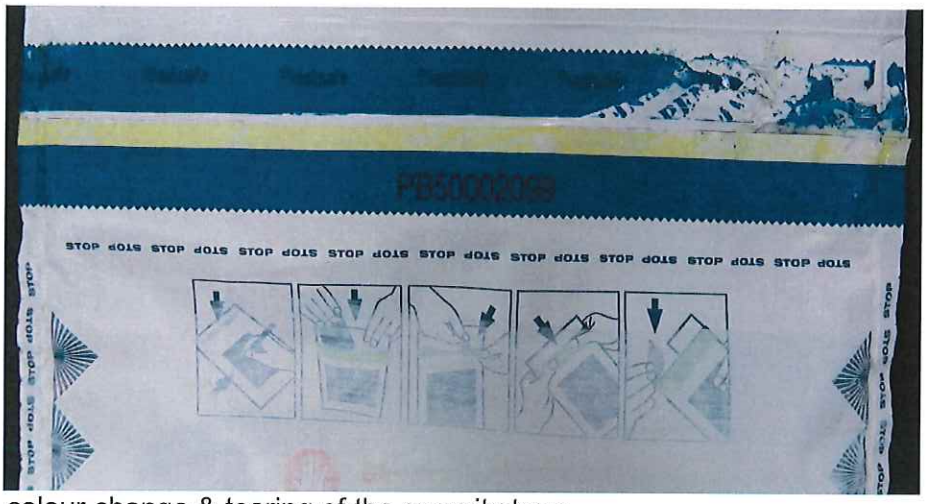
Examination period: 20 September 2016 to 30 September 2016

1. Solvent tests on the security tape and the sealing

One envelope was closed properly and two strips were cut out: one strip containing the security tape and one strip containing the imprint and the heat-sealed side seams of the envelope.

The strips were exposed to the solvent for 24 hours and subsequently attempts were taken to open and close the security tape and the sealing of the envelope without causing signs of manipulation. Furthermore the influence of the solvent on the imprint of the envelope was visually examined.

The tests were performed with Ethanol and Toluene.

Solvent	Test result
Ethanol	The security tape could be removed, but it was teared apart. The colour of the security tape changed from green to blue. The imprint of the bag's outer side was not removed, but could be wiped off. The side seams of the envelope could not be opened without destructing them. The test was performed on envelope no. PB50002099.  original sample  colour change & tearing of the security tape

Solvent	Test result
Toluene	The security tape could be removed. The words "OPENED/STOP" became repeatedly visible on the security tape and in the area of the security bag's opening. The imprint of the bag's outer side was not removed, but could be wiped off. The side seams of the envelope could not be opened without destructing them. The test was performed on envelope no. PB50002100.  original sample  appearance of "OPENED/STOP" - security sign

Evaluation of the results of the solvent tests:

Attempts to open the security tape of the envelope after storage for 24 hours in the above mentioned solvents lead to the irreversible appearance of a security sign (the words "OPENED/STOP" and/or a colour change of the security tape) and/or to the disappearance of the imprint of the bag´s outer side.

Attempts to open the heat-sealed side seams of the envelope after storage for 24 hours in the above mentioned solvents lead to the irreversible breaking of the envelope.

2. Determination of Film Thickness *

The determination was performed according to ISO 4593 by mechanical scanning. 20 measurements were performed on the plastic film of the security bag.

Apparatus: Mahr Millitron 1202 D
Clamping force: 0,3 N
Measuring surfaces: lower face: plane / upper face: radiused

Result:

Film thickness in µm			
Average value	Minimum	Maximum	Standard deviation
66.3	60	74	4.3

3. Temperature tests on the security tape

Two envelopes were closed properly and were exposed to a certain temperature in a climate chamber or an oven. After 2 hours storage time attempts were taken to open and close the security tape of the envelopes in hot / cold condition without causing signs of manipulation.

The test was performed at the following temperatures:
Room temperature (23 °C), 60 °C, 105 °C and –20 °C.

Additionally a test was performed on the security tape of one properly closed envelope with a cooling spray (immediate freezing at about -40°C) at an exposure time of 1 minute.

Temperature	Test result
Room temperature (23 °C)	The security tape could not be removed without destructing it. During the manipulation attempt the words "OPENED/STOP" became partly visible on the security tape and in the area of the security bag's opening. The test was performed on envelope no. PB50002109.  original sample  tearing of security tape, appearance of "OPENED/STOP" security sign

Temperature	Test result
- 20 °C	The security tape could not be removed without destructing it. During the manipulation attempt the words "OPENED/STOP" became partly visible on the security tape and in the area of the security bag's opening. The test was performed on envelope no. PB50002110.  original sample  tearing of security tape, appearance of "OPENED/STOP" security sign
Immediate Freezing (- 40 °C)	The security tape could not be removed without destructing it. During the manipulation attempt the words "OPENED/STOP" became partly visible on the security tape and in the area of the security bag's opening. The test was performed on envelope no. PB50002111.  original sample  tearing of security tape, appearance of "OPENED/STOP" security sign

Temperature	Test result
60 °C	The security tape could not be removed without destructing it. During the manipulation attempt the words "OPENED/STOP" became partly visible on the security tape and in the area of the security bag's opening. The heat indicator showed an irreversible red dyeing. The test was performed on envelope no. PB50002112.  original sample  tearing of security tape, appearance of "OPENED/STOP" security sign, colour change of heat indicator
105 °C	The security tape could not be removed without destructing it. During the manipulation attempt the words "OPENED/STOP" became partly visible on the security tape and in the area of the security bag's opening. The heat indicator showed an irreversible red dyeing. The test was performed on envelope no. PB50002113.  original sample  tearing of security tape, appearance of "OPENED/STOP" security sign, colour change of heat indicator

Evaluation of the results of the temperature tests:

Attempts to open the security tape after 2 hours exposure at the above mentioned temperatures lead to the irreversible appearance of a security sign (the words "OPENED/STOP" and/or dyeing of the heat indicator) and/or the irreversible breaking of the security tape.

4. Cutting test on the borders

Attempts were taken to open the envelopes by cutting and then trying to glue and re-seal the open places again without causing signs of manipulation. This was performed below the security tape, on the left and the right border and on the bottom of the envelope.

The manipulation was done on two envelopes by glueing with a special PE-glue and on two envelopes (one of each bag size) by sealing with a heat-sealing machine (sealing parameters: 110 °C / 300 N / 2,0 s).

The visual inspection was performed by a person not involved in the preparation of the bags. This person tried to detect the manipulated places on the bags.

Place of manipulation	Manipulation method	Result of the visual inspection
bottom of the bag	glueing	detected
right border beneath seal	glueing	detected
below the security tape	glueing	detected
left border beneath seal	glueing	detected
bottom of the bag	sealing	detected
right border beneath seal	sealing	detected
below the security tape	sealing	detected
left border beneath seal	sealing	detected

Evaluation of the results of the cutting test (visual inspection):

Attempts to tamper with the envelopes using the above mentioned methods lead to signs of manipulation detected during the above mentioned visual inspection.

The accreditation (Register no. D-PL-14160-01-01 and D-PL-14160-01-02) applies to the methods marked with * in the test report.

End of report